

## **Abstract**

### **METHODS AND APPARATUS FOR ULTRASOUND VELOCITY MEASUREMENTS IN DRILLING FLUIDS**

The disclosure relates to methods and apparatus for determining the velocity of an ultrasound pulse in drilling fluids in downhole environments. A method for determining a velocity of ultrasound propagation in a drilling fluid in a downhole environment includes emitting an ultrasound pulse into the drilling fluid in a borehole using a first ultrasound transducer (37); detecting the ultrasound pulse after the ultrasound pulse has traveled a distance (d); determining a travel time (t) required for the ultrasound pulse to travel the distance (d); and determining the velocity of ultrasound propagation from the known distance (d) and the travel time (t). An apparatus for determining a velocity of ultrasound propagation in a drilling fluid in a downhole environment includes a first ultrasound transducer (37) disposed on a tool; and a circuitry (82) for controlling a timing of an ultrasound pulse transmitted by the first ultrasound transducer (37) and for measuring a time lapse between ultrasound transmission and detection after the ultrasound pulse has traveled a distance (d).